INSTRUCTIONS
FOR THE
OPERATION AND CARE
OF

Cooper

TYPE "RVE" 1 h.p. ENGINE

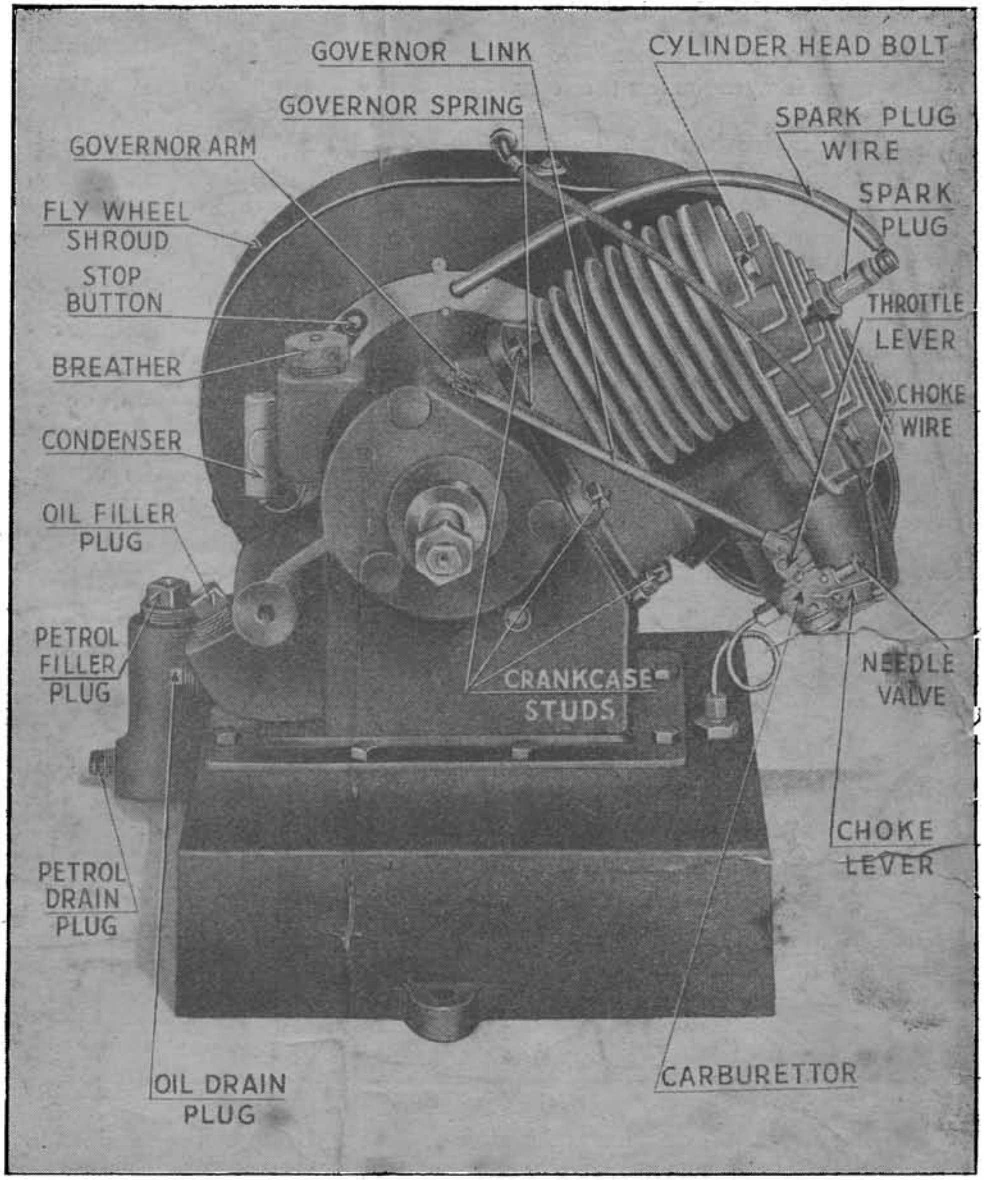
AND

Cooper

12-volt · 300-watt
GENERATING SET

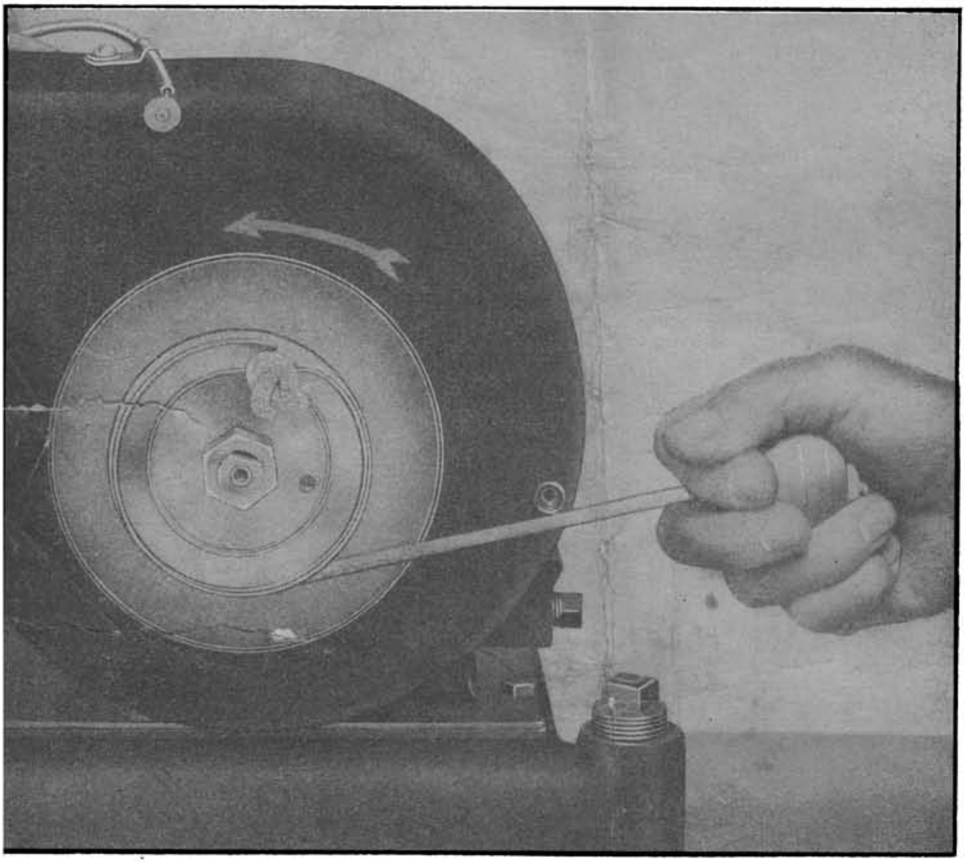
Engine Made and Guaranteed by
COOPER ENGINEERING COMPANY PTY. LTD.
SYDNEY AND MELBOURNE

1 h.p. Type "RV" and "RVE" Air Cooled Engine



How to Start

1. Be sure crankcase is filled with oil—see "Lubrication," page 3.
2. Fill base with regular grade petrol. **Do not use leaded petrol.**
3. Pull upon choke button. Do not, however, use the choke to start when engine is warm, unless necessary.
4. Turn engine back until compression is felt. Put knotted end of cord through slot in starting pulley and wind cord tightly over top of and around pulley until ball on other end is close to pulley. Grasp ball in hand, and, standing back from engine, pull smartly on cord, when engine should start. Illustration shows what is required.



5. Push choke button in gradually immediately engine starts.

How to Stop

Press stop button at the back of flywheel housing. See illustration, page 1.

Lubrication

Lubrication of moving parts is accomplished by the SPLASH system. The cam gear operates in an oil sump in such manner that oil is picked up between the teeth of the gear and is forced out with considerable pressure as the teeth of this gear mesh with those of the crankshaft gear. The spray of oil from the gears is picked up by the revolving crankshaft and is distributed throughout the crankshaft and cylinder. Thus, an ample supply of oil reaches all bearings and bearing surfaces.

It is essential that the crankcase be kept full of oil. With the engine in constant work the oil level should be inspected daily and "topped up" as needed. Oil circulation commences the instant the engine is started.

The use of an S.A.E. No. 20 oil, manufactured by a reputable concern, is recommended.

Care of Fuel System

No difficulty should be experienced with this system if good, clean petrol is used and is poured into the base from a clean container and funnel—be sure both are clean. See that plug with hole is always screwed into petrol tank. Do not confuse it with oil filler plug in crankcase

The check valve assembly at the bottom of the fuel pipe, in the base, should be removed periodically for cleaning. Simply blow through the pipe from the screened end after washing the screen in petrol; it is not necessary to take the check valve assembly apart.

When connecting fuel pipe again make certain connections are airtight. This is important, since the carburettor is of the vacuum lift type and air seepage at either end of fuel pipe will result in hard starting and faulty operation.

Carburettor Adjustment

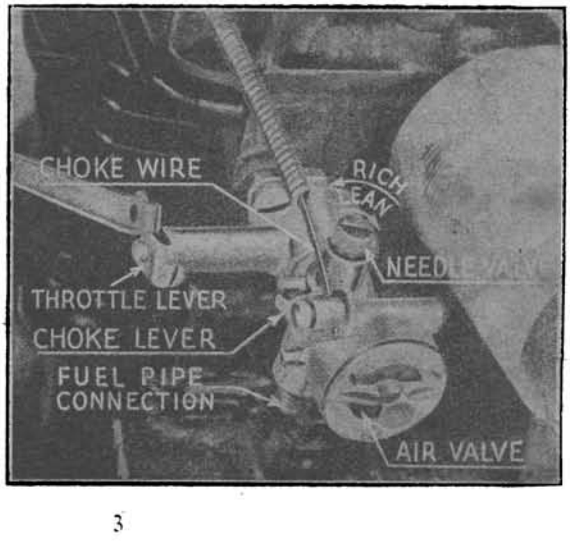
When adjustment of carburettor is found necessary, proceed as follows:—

1. Turn needle valve to right until it rests gently on its seat. In no circumstances screw it down tightly, as this will injure both needle and seat, and make it difficult to obtain satisfactory adjustment thereafter.

2. Unscrew needle valve approximately ¾ turn.

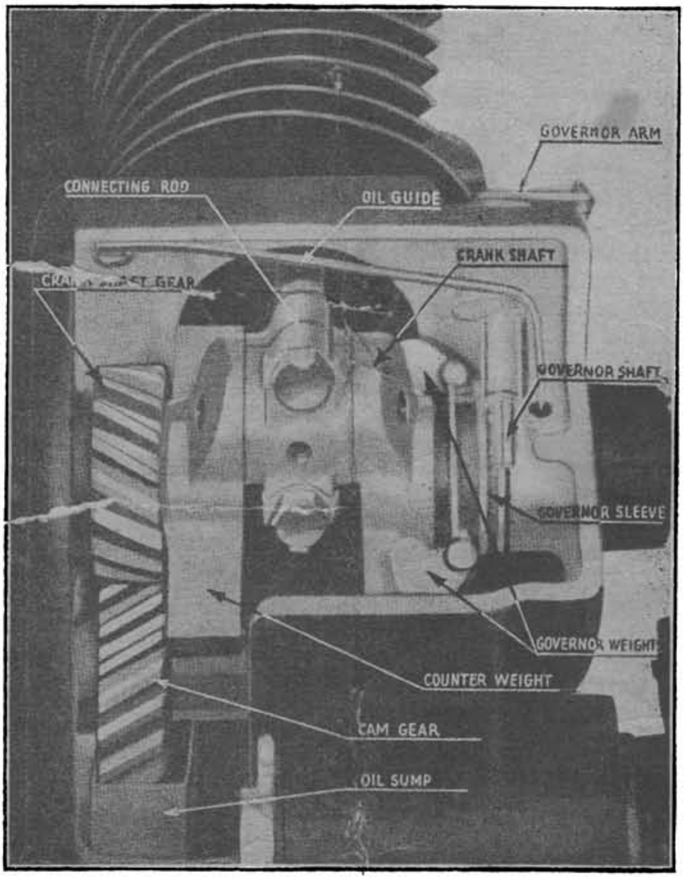
3. Start engine, and allow to run under load until normal operating temperature is reached.

4. Turn needle valve slowly to right until engine loses speed through mixture having become too lean. Note position of marker, and then turn needle valve slowly to left until engine appears to labour and the speed drops slightly. Note position of marker again, then slowly turn needle valve to right until it is midway between the lean and the rich settings. On an average, this will result in the valve being about half a turn open under full load when engine is warm.



If the carburettor throttle lever has been removed, or if it needs adjustment, turn butterfly valve (see "Governor Throttle Control") to right until completely closed, then, with governor arm in wide-open position, replace throttle lever on butterfly shaft. Draw up lightly on screw, rotate throttle lever to right until governor arm is parallel with, or slightly beyond, crankshaft, then tighten lever screw.

Governor Throttle Control



The engine is designed to operate at speed shown on name plate, and the carburettor is constructed with a butterfly valve controlled by a mechanical governor as the engine load varies.

The governor is built on to the crankshaft and is of the fly-weight centrifugal type, connected to the carburettor valve by means of a small crank arm and link.

While the engine is motionless the butterfly valve is held open by a small spring attached to the control link, but upon its being started the governor weights are thrown outwards, due to centrifugal force, thus causing movement of the governor arm which results in partial closing of the butterfly valve, with a consequent reduction of the charge admitted to the cylinder. As the engine speed increases the greater is the effect on the governor weights, and the resultant movement of the governor arm will close the butterfly valve to the point where correct speed is maintained.

Any increase in the load put on the engine will cause a drop in the revolutions, thereby diminishing the centrifugal force on the governor weights, which action will result in the butterfly valve opening to admit a larger charge until normal engine speed has been reached.

Governor control is adjusted at the factory and should not be altered.

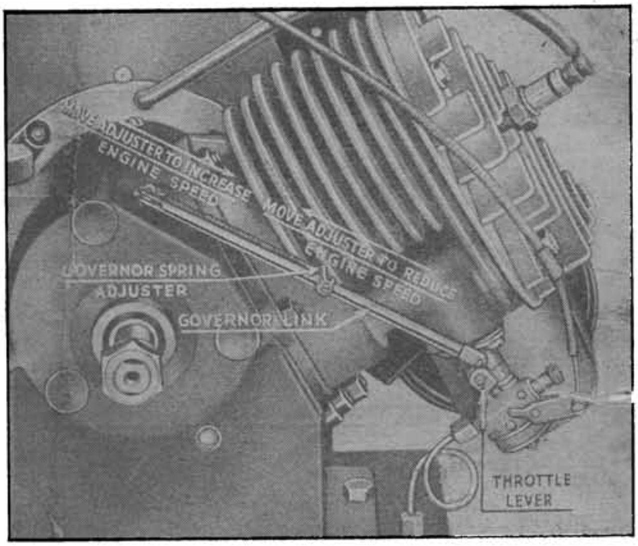
To Adjust Engine Speed

The speed of the engine is controlled by the action of the governor and the tension of the governor spring, therefore, any change in the tension of this spring will affect the speed.

Since the spring acts to hold the butterfly valve open to admit a full charge to the cylinder, a decrease in tension will result in slower engine speed. An increase in the speed is then obtained by increasing the tension of the spring.

If it is thought that the engine is not running at right speed, use an indicator on the crankshaft to check it. If the speed is higher than that indicated on name plate slacken tension of the spring. If the speed be found lower than it should be, it may be raised simply by increasing tension.

CAUTION. Do not attempt to stretch the governor spring. Any change in its length will render it useless for obtaining correct speed and speed variation


MOVE ADJUSTER TO INCREASE ENGINE SPEED
MOVE ADJUSTER TO REDUCE ENGINE SPEED
GOVERNOR SPRING ADJUSTER
GOVERNOR LINK
THROTTLE LEVER

Cooling

The fins on the cylinder and cylinder head of the engine radiate excess heat generated within the cylinder.

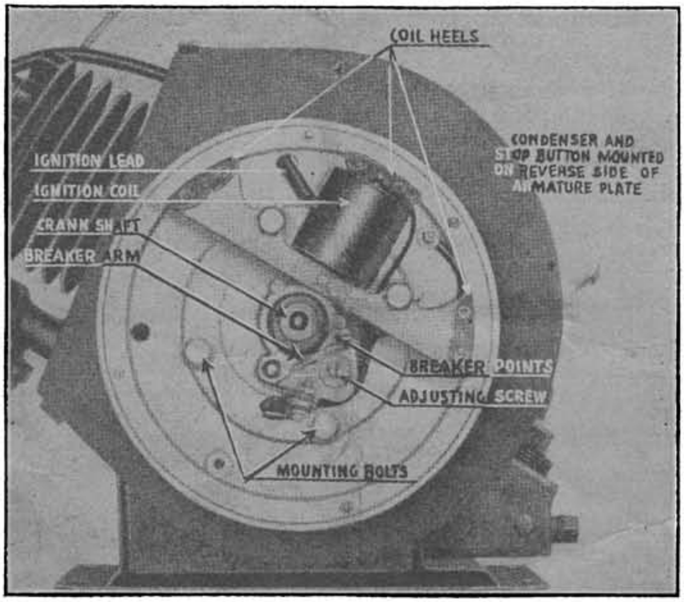
To ensure ample supply of air for cooling purposes under all conditions a blower system is built into the engine. The system comprises a series of air fins cast on to the face of the flywheel which is covered by a shroud the purpose of which is to direct a blast of air continuously on to the cylinder and cylinder head. This system ensures the maintenance of a satisfactory operating temperature.

The cooling system requires no attention. In the event of overheating consult the Trouble Chart, page 14.

The Magneto

This is a self-contained unit and consists, chiefly, of an armature plate on which are mounted ignition coil, condenser, and breaker points, with a permanent magnet built into the flywheel.

Its operation is extremely simple. As the pole pieces of the magnet pass over the heels of the coil a magnetic field is built up about the coil, causing a current to flow through the primary winding.



At the proper time the breaker points are opened by the action of a "flat" machined on the crankshaft, thus breaking the primary circuit. This stops the flow of primary current, causing the magnetic field about the coil to break down instantly, thereby inducing an electrical current of high voltage in the fine secondary winding of the coil. This high voltage current is carried to the spark plug where it jumps the gap between the points, to ignite the compressed charge in the cylinder.

Owing to its rugged construction the magneto may be relied upon to function efficiently throughout the life of the engine. It needs no lubrication, and no attention other than an occasional inspection of the breaker points and spark plug connection.

Care of Ignition System

SPARK PLUG—Remove occasionally for cleaning and adjustment of points, the correct gap between which is .020".

Examine insulator of plug for cracks, as hard starting, missing and faulty running of engine are often caused by a defective insulator.

Be sure insulator is both clean and dry before replacing plug. Wipe off any traces of moisture with dry cloth.

Test the plug by placing it, with cable attached, on cylinder head of engine, and turn engine over to observe the spark between points. In a very bright light the spark may not be visible, but a pronounced "snap" is audible when sparking takes place.

IMPORTANT.—When a new plug is required be sure to get one with a 14 mm. thread.

MAGNETO.—In no circumstances tamper with this unless it is evident that the hard starting and faulty running of engine is due to some irregularity in the magneto.

Before attempting adjustments, remove cable from spark plug and hold terminal on cable about ⅛" from cylinder head, and turn engine over. If there is no spark between terminal and engine, or only a weak one, the trouble will most likely result from improperly adjusted, pitted, or corroded breaker points. In such case it is necessary to remove the flywheel.

Proceed as follows:—Remove shroud covering flywheel, then flywheel nut and grooved starting pulley. Get someone to grasp the rim of the flywheel, to absorb shock, then strike end of crankshaft a light blow with a mallet or piece of wood. One or two blows usually suffice. BE CAREFUL NOT TO INJURE END OF CRANKSHAFT.

It can now be seen that the breaker points are operated by a flat surface machined on the crankshaft,

To examine the points, spread them with a blunt instrument. If pitted or corroded, turn crankshaft until points close, then insert a small, flat file between them. Draw file gently back and forth to dress down the points.

To check breaker point gap, turn crankshaft slowly until points have opened wide. Insert feeler gauge between points—correct gap setting is .012".

If necessary to make corrections, loosen breaker plate adjusting screw—see page 6. Increase the gap by moving breaker assembly towards crankshaft; reduce it by moving the assembly in opposite direction. NOTE.—Breaker gap is governed by distance from follower to centre of crankshaft when passing over flat section.

Tighten breaker plate adjusting screw.

Replace flywheel, pulley and nut, making certain flywheel key is properly placed in keyway. THIS IS IMPORTANT.

Tighten nut with large wrench.

Replace shroud. Attach cable to plug and start engine as directed. Allow to run for 10-15 minutes, then stop and re-tighten flywheel nut.

CAUTION.—A loose flywheel will result in the engine knocking, in irregular running, in flywheel hub cracking, and in possible injury to both engine and operator.

Removing Carbon and the Care of Valves

After a long period of operation it may be necessary to detach the cylinder head to remove carbon from the combustion chamber, the head of the piston and the valves.

Scrape off the carbon with a blunt instrument, taking care not to scratch the head of piston. After scraping, wash cylinder head, head of piston, valves and gasket with petrol.

Excess carbon deposit should be removed, also, from the valve seats and the valves. To do this turn flywheel slowly until one valve has opened; apply small quantity of kerosene to valve and seat; turn flywheel until valve closes, making sure valve has seated; turn valve back and forth with valve-grinding tool to work off carbon from both valve and its seat.

Adopt same procedure with the other valve.

GRINDING VALVES.—If the valves or valve seats are badly pitted, the valves must be ground in if loss of compression is to be overcome. This necessitates the removal of the cylinder from the crankcase, as well, of course, as the head from the cylinder, likewise the taking-off of the flywheel, shroud and starting pulley as directed on page 7 under "Magneto."

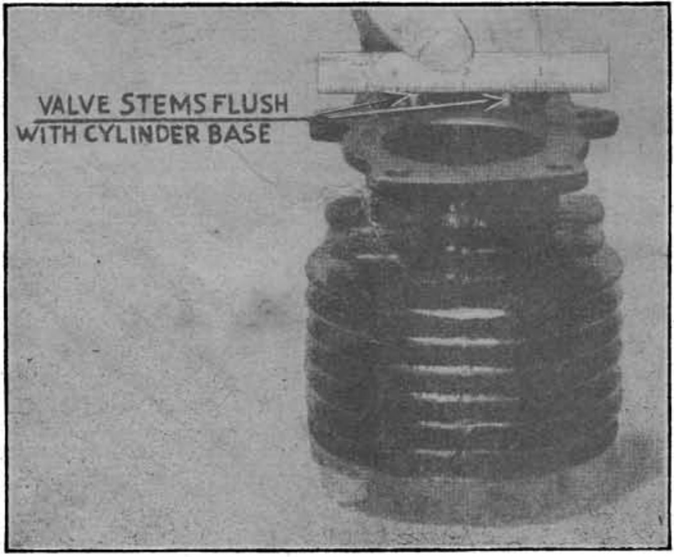
Remove the nuts from crankcase studs and lift cylinder off. Compress valve springs to withdraw retainer pins. Remove valves, retainers and springs. **Note that exhaust valve is distinguished by marking not found on the inlet valve, and care must be taken, when replacing valves, to see that each is put back into its right place.**

Scrape excess carbon from heads and stems of valves, and from valve guides and seats in cylinder block, then wash with petrol.

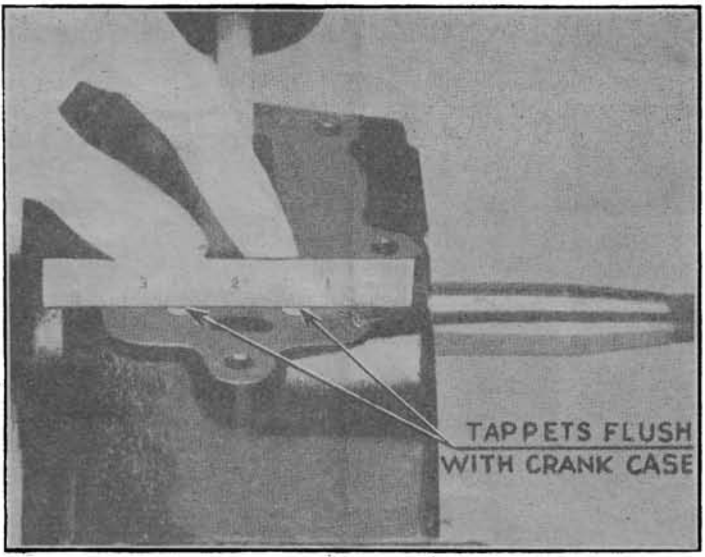
Next, coat the face of valve with medium-fine valve-grinding compound.

Replace valve in guide and grind in by turning back and forth with valve-grinding tool, making sure the valve is on its seat. Two minutes of grinding should be sufficient for each valve.

With petrol, wash off from both valves and seats all traces of the grinding compound, taking care that none of the compound is washed into the engine cylinder or the valve guides. Replace valves in their respective guides, as stated previously.



Now check tappet clearance. This is done by seeing that the ends of the valve stems (with the valves seated) are flush with the base of the cylinder, and that the tappets are flush with the face of the crankcase — as shown in this illustration and that on page 9. When the gasket is in position between crankcase and cylinder the necessary tappet clearance (.010" to .012") is provided.



Should it be found, however, that the valve stems protrude beyond the base of cylinder, grind the ends of the stems carefully until they are flush with the base. Make certain that the end is ground off square with stem. The tappets are adjusted flush with the crankcase, at the factory, and should require no attention other than an inspection at intervals. Now reassemble valves, springs and retainers in the order in which they were taken apart.

Coat both sides of the gasket lightly with grease, place it in position over the studs in crankcase, and replace cylinder in position, compressing the piston rings slightly to facilitate piston entering cylinder. Take care not to break, or even bend, rings. A sprung ring will never seal properly.

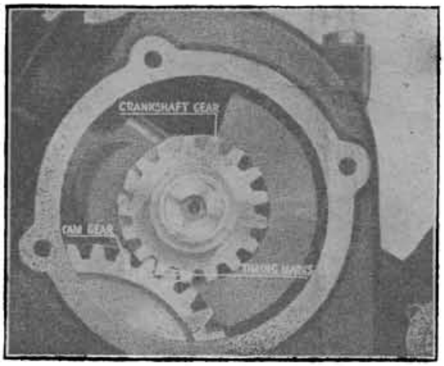
Replace nuts on crankcase studs and tighten them evenly—each one a little at a time. Then replace cylinder head.

Next, replace armature plate, flywheel and shroud as instructed on page 7.

IMPORTANT.—Be sure flywheel nut is tight. Run the engine for from 10 to 15 minutes, then re-tighten nut. Serious injury to both crankshaft and flywheel will result if engine be run with flywheel nut loose.

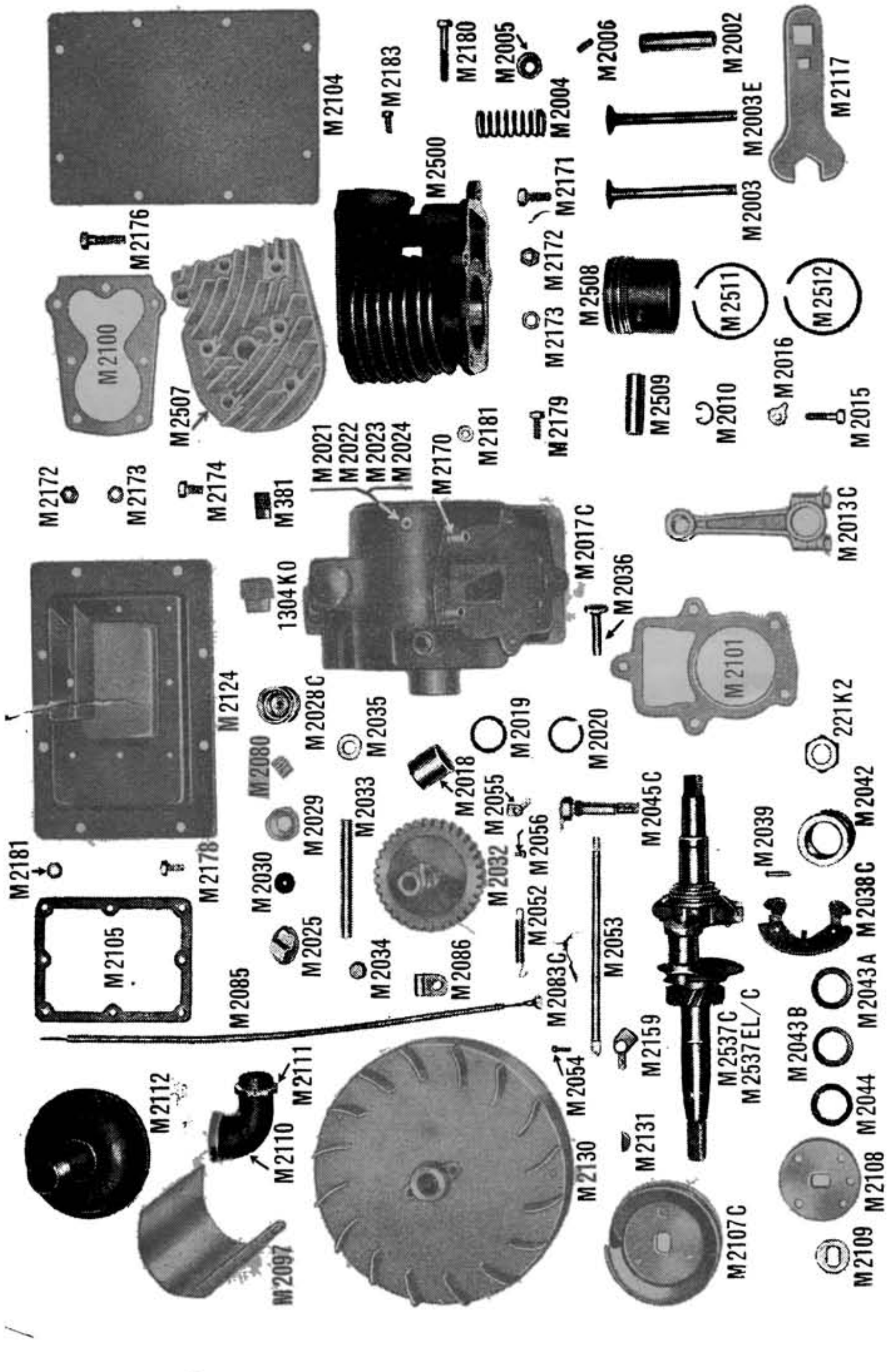
Timing

Ignition.—Since set ignition timing, without either advance or retard, is provided in the engine, the timing of the ignition is done at the factory and cannot be altered. The width of the breaker point gap, of course, has some effect on timing, nevertheless if the breaker points be adjusted in accordance with directions given on page 7, the timing will be correct.



Valves.—The valves were properly timed before the engine left the factory. However, if the engine has been taken down and the valves thus thrown out of timing, proceed as follows to re-time them:—Note the punch marks on cam gear and crankshaft gear. Put crankshaft in engine with the punch-marked tooth of the gear downwards, as shown in the illustration. Then insert the camshaft in the engine so that the marked tooth of the crankshaft gear is between the two marked teeth of the cam gear.

ENGINE PARTS



ENGINE PARTS

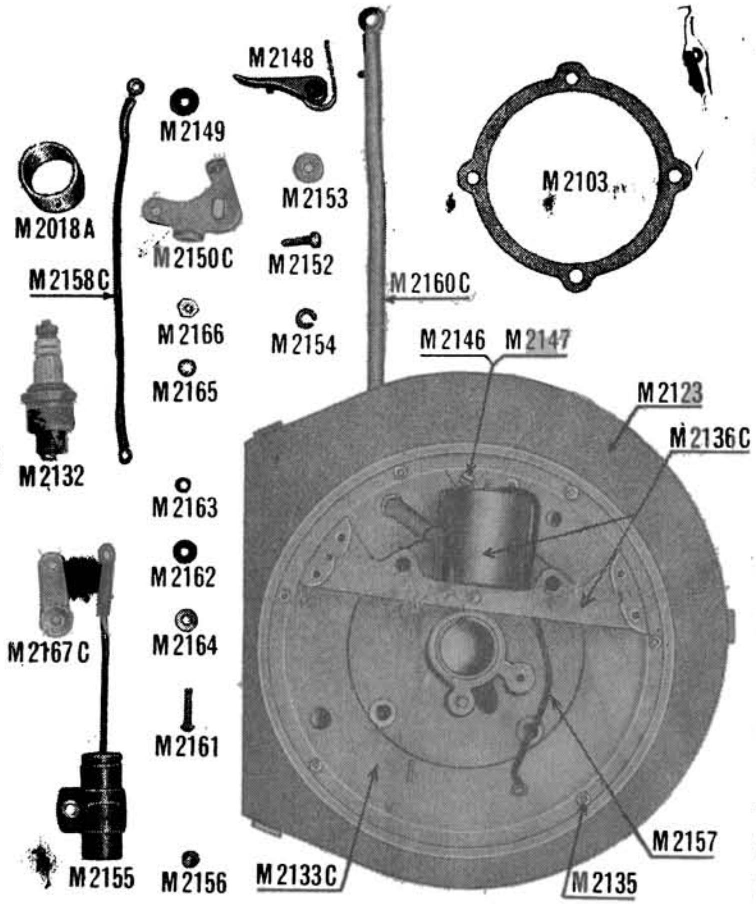
Number.	Description.	No. Used.
M2002	Valve Guides	2
M2003	Inlet Valve	1
M2003E	Exhaust Valve	1
M2004	Valve Spring	2
M2005	Valve Washers	2
M2006	Valve Pins	2
M2010	Piston Pin Lock Ring	2
M2013C	Connecting Rod, with Screws and Washers (can only be supplied complete)	1
M2015	Con. Rod Set Screw	2
M2016	Con. Rod Lock Washer	2
M2017C	*Crankcase with Bearing Bush and 2 Cylinder Studs	1
M2018	Crankcase Bearing Bush	1
M2019	Oil Seals	2
M2020	Oil Seal Retainer	2
M2021	Oil Guide (not shown)	1
M2022	Oil Guide Screw	1
M202[illegible]	Oil Guide Screw Nut	1
M202[illegible]	Oil Guide Screw Washer	1
M2025	Breather Baffle	1
M2028C	Breather Cap and Pin	1
M2029	Breather Sleeve	1
M2030	Breather Bakelite Washer	1
M2032	Cam Gear and Shaft	1
M2033	Cam Shaft Pin	1
M2034	Cam Shaft Pin Retainer	2
M2035	Cam Shaft Washer	1
M2036	Tappets	2
M2038C	*Governor Yoke and Weight Assembly	1
M2039	Rivets attaching Governor Yoke to Crankshaft	2
M2042	Governor Sleeve	1
M2043A	Crankshaft Thrust Washer (Thin)	1
M2043B	Crankshaft Thrust Washer (Thick)	1
M2044	Crankshaft Thrust Washer (Grooved)	1
M2045C	*Governor Bushing Assembly	1
M2052	Governor Spring	1
M2053	Governor Link	1
M2054	Governor Link Split Pins	2
M2055	Throttle Crank	1
M2056	Screw for Throttle Crank and Governor Spring Adjustment	2
M2080	Breather Spring	1
M2083C	Choke Wire and Button	1
M2085	Choke Wire Casing	1
M2086	Choke Wire Clip	2
M2097	Carburettor Shield	1
M2100	Gasket (Cylinder Head)	1
M2101	Gasket (Cylinder to Crankcase)	1
M2104	Gasket for Base	1

Number.	Description.	No. Used.
M2105	Gasket for Crankcase Cover	1
M2107C	Starter Pulley	1
M2108	Pulley Washer (Large)	1
M2109	Pulley Washer (Small)	1
M2110	Exhaust Elbow	1
M2111	Exhaust Elbow Lock Nut	1
M2112	Muffler	1
M2116	Base (Petrol Tank) (not illustrated)	1
M2117	Spanner	1
M2118	Shroud around Flywheel (not illustrated)	1
M2124	*Crankcase Cover and Oil Sump	1
M2130	Flywheel	1
M2131	Flywheel Key	1
M2159	Spring Adjuster for Governor	1
M2170	$\frac{5}{16}$in. x 1in. Stud in Crankcase	2
M2171	$\frac{5}{16}$in. x $\frac{7}{8}$in. Hex. Set Screw, Cylinder to Crankcase	3
M2172	$\frac{5}{16}$in. Hex. Nut for Crankcase and Base Studs	3
M2173	$\frac{5}{16}$in. Flat Washer (State number wanted)	
M2174	$\frac{5}{16}$in. x $\frac{1}{2}$in. Hex. Set Screw attaching Engine to Base	8
M2176	$\frac{5}{16}$in. x $1\frac{1}{8}$in. Hex. Set Screw for Cylinder Head	7
M2178	$\frac{1}{4}$in. x $\frac{1}{2}$in. Hex. Set Screw attaching Crankcase Cover to Crankcase	8
M2179	$\frac{1}{4}$in. x $\frac{5}{8}$in. Hex. Set Screw attaching Armature Plate to Crankcase	2
M2180	$\frac{1}{4}$in. x $1\frac{5}{8}$in. Hex. Set Screw attaching Armature Plate to Crankcase	2
M2181	$\frac{1}{4}$in. Flat Washer (State number wanted)	
M2183	$\frac{7}{32}$in. x $\frac{1}{2}$in. Cheese Head Screw attaching Carburettor to Cylinder	2
M2184	$\frac{3}{8}$in. Pipe Plug for Base (like 1304K0), with drilled hole	1
M2500	Cylinder with Valve Guides	1
M2500C	Cylinder with Guides and Valves complete	1
M2507	Cylinder Head	1
M2508	Piston	1
M2508C	Piston with Rings, Pin and Lock Rings	1
M2509	Piston Pin	1
M2511	Piston Ring (Compression)	2
M2512	Piston Ring (Oil)	1
M2537C	*Crankshaft, Pinion and Governor Assembly for "RV" Engine (one end tapered, one end stepped, as illustrated)	1
M2537EL/C	Crankshaft, Pinion and Governor Assembly for "RVE" Engine (both ends tapered, not shown)	1
221K2	$\frac{5}{8}$in. S.A.E. Hex. Nut for Crankshaft	1
M381	$\frac{1}{4}$in. Pipe Plug for Crankcase and Base	2
1304K0	$\frac{3}{8}$in. Pipe Plug for Crankcase	1

* Assemblies marked thus will be supplied only as illustrated or described. Those parts of such assemblies as are listed may, however, be had separately.

When ordering, carefully check description in list with parts required and USE BOTH NUMBER AND DESCRIPTION ON ORDER.

IGNITION SYSTEM PARTS



Number.	Description.	No. Used.
M2018A	Armature Plate Bearing Bush	1
M2103	Gasket (Bearing Plate). State number wanted.	
M2123	Back Plate for Shroud	1
M2132	Spark Plug	1
M2133C	*Armature Plate with Bearing Bush	1
M2133G	Armature Plate, complete with Bearing Bush, Back Plate and Coil and Heels Assembly	1
M2135	Rivets attaching Armature Plate to Back Plate.	6
M2136C	*Coil and Heels Assembly	1
M2146	Screw attaching Coil and Heels Assembly to Armature Plate	1
M2147	Spring Washer for M2146	1
M2148	*Breaker Arm and Point	1
M2149	Insulating Washer under Breaker Arm	1
M2150C	*Breaker Base and Point	1
M2152	Screw for setting Breaker Base and attaching Shroud to Back Plate	2
M2153	Flat Washer for M2152 Screw	2
M2154	Spring Washer for M2152 and M2156 Screw	2
M2155	*Condenser and Lead	1
M2156	Condenser Mounting Screw	1
M2157	*Lead Wire with lug for Coil	1
M2158C	*Lead Wire with lugs for Stop Button	1
M2160C	*High Tension Cable with Spark Plug Terminal	1
M2161	Terminal Screw for Breaker Base and Stop Button	2
M2162	Insulating Washer for M2161 Screw	State Number Wanted
M2163.	Insulating Bushes for M2161 Screw	
M2164	Flat Steel Washer for M2161 Screw	
M2165	Lock Washer for M2161 Screw	
M2166	Nut for M2161 Screw	
M2167C	*Stop Button Assembly	1

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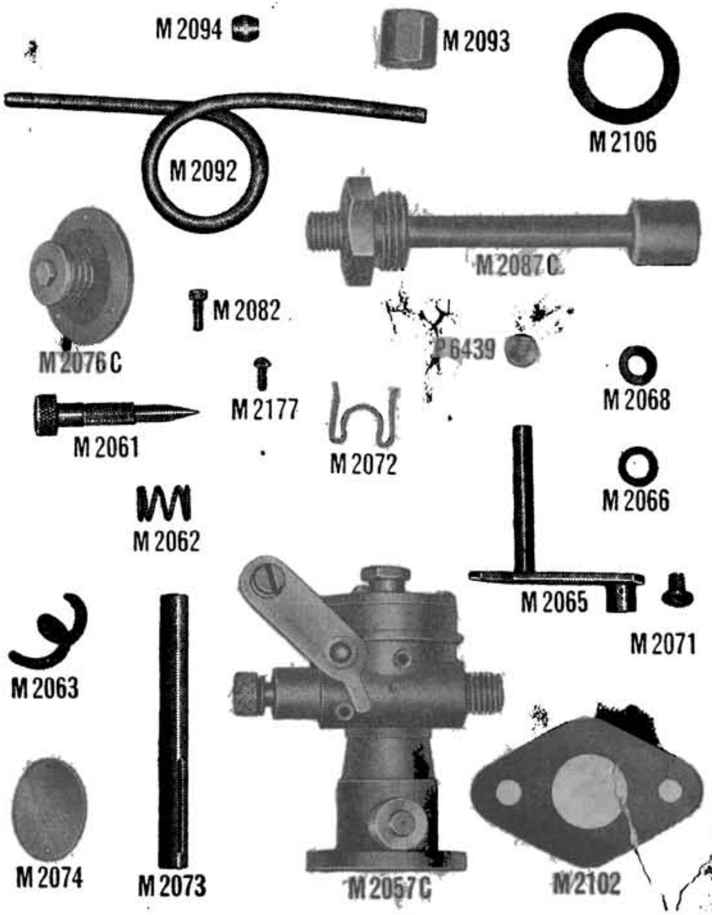
FUEL SYSTEM PARTS



Number.	Description.	No. Used.
M2057	Carburettor Body with Needle Valve Seat and Jet	1
M2057C	Carburettor, complete	1
M2061	Carburettor Needle Valve	1
M2062	Needle Valve Spring	1
M2063	Needle Valve Packing	1
M2065	*Choke Spindle, Lever and Swivel Assembly	1
M2066	Choke Spindle Washer	1
P6439	Choke Spindle Screw	1
M2068	Choke Spindle Spring Washers	2
M2071	Choke Swivel Screw	1
M2072	Choke Spring	1
M2073	Throttle Spindle	1
M2074	Throttle Valve	1
M2076C	*Air Valve Plate Assembly	1
M2082	Screw for Throttle Spindle	1
M2087C	*Check Valve Assembly	1
M2092	Fuel Pipe, only	1
M2093	Fuel Pipe Cap	2
M2094	Fuel Pipe Lining	2
M2102	Gasket (Carburettor) ....State number wanted	
M2106	Gasket Washer for Check Valve	1
M2177	Air Valve Plate Screws	3

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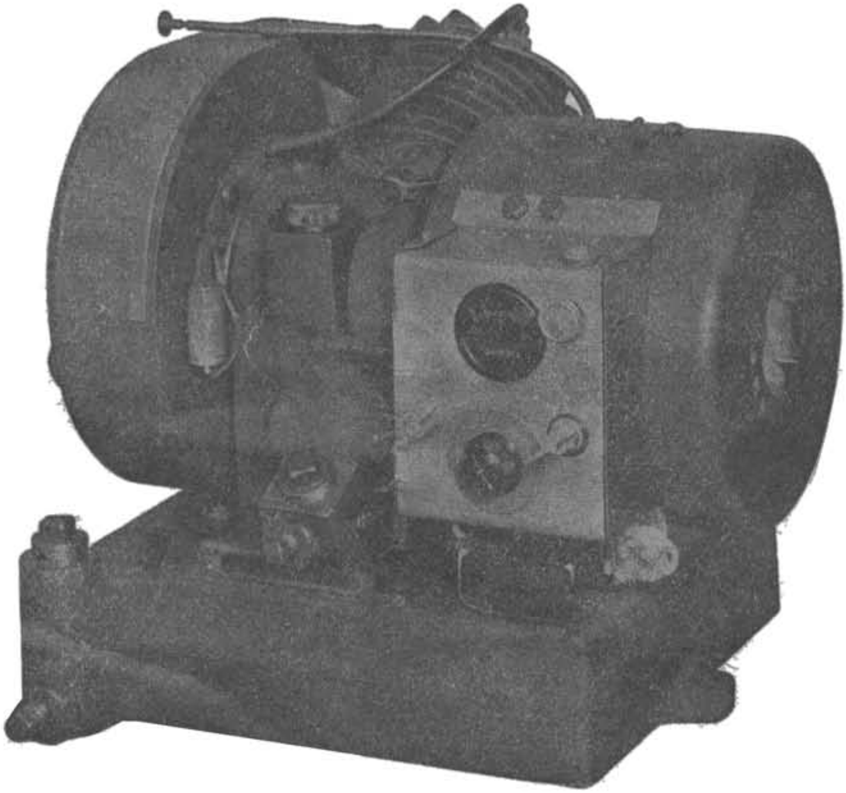
Trouble Chart

Fuel Supply	Tank empty. Fuel line clogged. Check valve not functioning. Air leak in fuel line. Water or foreign substance in petrol tank. Engine will not start if flooded. Allow to settle few moments before cranking again.
Carburettor	Choke not functioning. Clogged jet. Needle valve worked loose. Needle valve improperly adjusted. Loosely mounted.
Spark Plug	Ignition lead detached. Fouled by carbon or oil. Improperly adjusted points. Insulator cracked or broken. Insulator covered with moisture or residue.
Magneto	Pitted or improperly adjusted breaker points. Loose electrical connections. Defective condenser. Defective ignition coil.
Uneven Running (Surging) is Frequently Caused by	Defective spark plug. Improperly adjusted carburettor. Petrol low in tank. Air leak in fuel line. Water or foreign substance in tank. Governor link injured, bent or twisted, causing excessive drag on governor arm and carburettor lever. Should be straight, with no indication of binding. Loose electrical connections. Accumulation on magneto breaker points, pitted or corroded. Weak condenser, or ignition coil.
Engine	Loss of compression— Leaky valves. Sticky valves. (Valve stem and guide carboned.) Piston rings inactive. (Ring grooves filled with carbon.) Governor spring broken or detached.
Overheating	Oil level in crankcase too low. Carburettor adjusted too lean. Belt too tight. Restricted air flow around engine. Engine over-loaded. Leaky valves. Piston rings seized in ring grooves. Excessive accumulation of carbon.
Knocking	Engine not firmly installed. Engine over-loaded. Belt too tight. Carburettor adjusted too rich. Excessive accumulation of carbon. Flywheel loose. Connecting rod loose. Wrist pin and piston loose.

THE

PETROL ELECTRIC

300-WATT GENERATING SET



ABOVE IS AN ILLUSTRATION OF THE COMPLETE UNIT
which is available as 12 volts, 24 volts and 32 volts.

POINTS TO NOTE ARE:

- Choke Wire (on flywheel shroud).
- Condenser and Stop Button (on inside of armature plate).
- Petrol and Oil Filler and Drain Plugs.
- Ampmeter.
- Self Starter Button (beside ampmeter).
- Terminals for connection to Battery (negative on left, positive on right).
- Output Control Knob (between battery terminal nuts).
- Cutout (mounted between switch box and engine base).

The Generator

The STARTER-GENERATOR is a self-contained unit and requires no attention other than to regulate the output according to the load on the batteries to keep them properly charged. The output of the GENERATOR is indicated by the Ampmeter on the front panel and is adjusted by mean of the small knob on the front of the box. (See Page 1.) The GENERATOR is of the four pole, four brush, shunt wound type, and the output or charging rate is adjusted by means of a variable rheostat in series with the shunt field, which varies the excitation in the shunt field and increases or decreases the output accordingly.

The GENERATOR consists mainly of field frame, field coils (series field and shunt field) armature, brushes, and brush plate. It has no bearings that require attention, as the armature is mounted directly on the crankshaft and is supported by the engine bearings. It is also equipped with an electrical cut-out that automatically connects the GENERATOR to the batteries when the engine is started and disconnects the batteries when the engine stops, which prevents the battery from being discharged back through the GENERATOR after stopping.

Batteries

BATTERIES used with the set must be of the same voltage as the set.

BATTERIES must not be completely discharged before the GENERATOR is started, and a heavy load should not be drawn from the BATTERIES for any length of time without the GENERATOR in operation.

The Positive (+) post should be connected to the Positive (+) terminal (see page 1) on the front of the GENERATOR Control Box, and the Negative (—) post should be connected to the Negative (—) terminal on the GENERATOR Control Box by means of the battery leads and the battery clamp terminals.

The wires to the light should also connect direct to the batteries with these same battery clamp terminals which are used to connect the GENERATOR to the BATTERIES. After all the connections are made tight, the battery posts and clamps should be coated with a light coat of thin grease to prevent corrosion.

Care of Batteries

The batteries should be inspected at regular intervals and should be kept filled to within one-half inch above the plates with good, clean Distilled Water. Do not fill above this level, as the solution will expand with heat when the batteries are charged and overflow the cells. Do not use city water or well water, as the impurities in any but distilled water are harmful to a storage battery.

CAUTION.—Battery solution contains a POISONOUS, DANGEROUS ACID, and should not be spilled on clothing, upholstery, etc., nor allowed to come in contact with the skin. NOTE.—In case of accidental spillage, the battery solution should be washed off immediately with Ammonia Water.

To determine the amount of charge in a battery the cells should be tested with a hydrometer, and if the specific gravity is down to 1.150 or lower the GENERATOR should be started and left running until the specific gravity is 1.275 or higher. A fully charged battery has a specific gravity of 1.275 to 1.295.

How to Start

1. Be sure crankcase is filled with oil—see "Lubrication."
2. Fill base with regular grade petrol. Do not use leaded petrol.
3. Pull upon choke button. Do not, however, use the choke to start when engine is warm, unless necessary.
4. Turn the Output Control to HIGH (to the right as far as it will go). This is important in order that the starter will develop its maximum power when cranking the engine, especially during colder weather when the oil is in a congealed condition.
5. Firmly depress the Starter Button. After the engine has made several revolutions, the Choke should be slowly pushed in until the engine starts to fire and run under its own power. After the engine starts to run, release the Starter Button and slowly push the Choke all the way in, allowing sufficient time for the engine to warm up and run steadily.

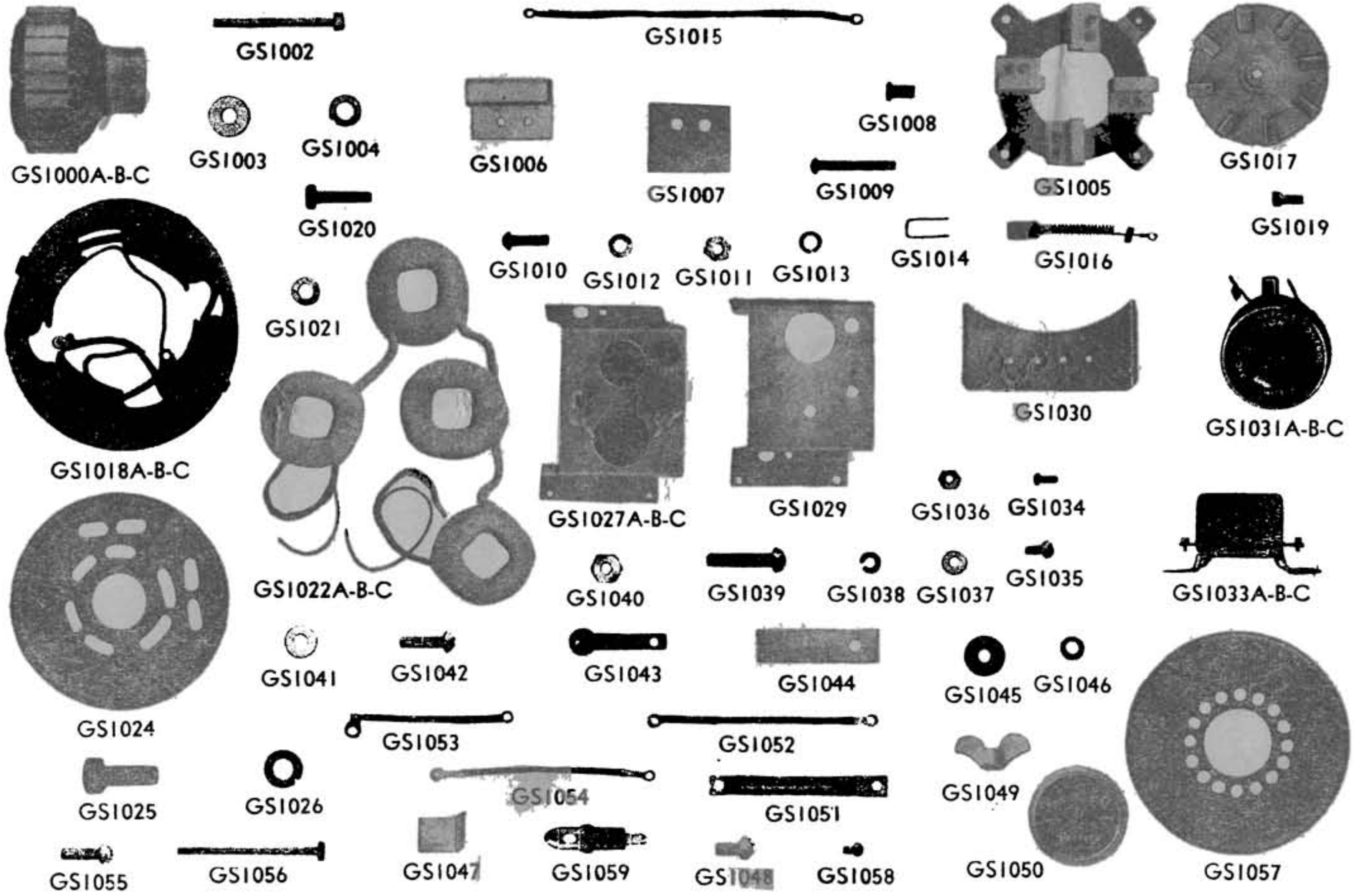
   If the engine does not start readily or runs unevenly, it is possible the needle valve (see page 5) may not be properly adjusted. (For details of how to do this, see heading of "Carburettor Adjustment" on page 5.)

To Start with Discharged Batteries.

Should the batteries become discharged to the point where they will no longer turn the engine when the Starting Button is pressed operate the Choke in the usual manner, wrap the starting rope around the starting pulley with the knot engaged in the slot, and spin the engine with a quick, steady pull. DO NOT JERK. Repeat as necessary until the engine starts.

How to Stop

Depress the Stop Button, located on the back of the magneto plate (see page 1), and hold down until the engine has completely stopped turning.


GS1000A-B-C
GS1002
GS1003
GS1004
GS1006
GS1015
GS1007
GS1008
GS1009
GS1005
GS1017
GS1019
GS1020
GS1010
GS1012
GS1011
GS1013
GS1014
GS1016
GS1018A-B-C
GS1021
GS1022A-B-C
GS1027A-B-C
GS1029
GS1030
GS1031A-B-C
GS1036
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GS1038
GS1037
GS1035
GS1033A-B-C
GS1024
GS1041
GS1042
GS1043
GS1044
GS1045
GS1046
GS1053
GS1052
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GS1025
GS1026
GS1054
GS1051
GS1057
GS1055
GS1056
GS1047
GS1059
GS1048
GS1058
GS1050

Generator Parts

Number	Description	No. Used
GS1000A	Armature, 12 Volt	1
GS1000B	Armature, 24 Volt	1
GS1000C	Armature, 32 Volt	1
GS1002	Bolt, Holding Armature (uses 1 each GS1003 and GS1004)	1
GS1003	Washer, Armature (fits GS1002)	1
GS1004	Lock Washer, Armature (fits GS1002)	1
GS1005	Brush Holder Assembly (uses 4 each GS1009, GS1006)	1
GS1006	Brush Holder	4
GS1007	Insulating Plate, Brush Holder	2
GS1008	Insulating Bush, Brush Holder	4
GS1009	Screw, Terminal Brush Holder (4 on GS1005, uses 8 GS1011 and 6 GS1012)	4
GS1010	Screw, Holding Brush Holder (uses 4 GS1011 and 2 GS1012)	4
GS1011	Nut, Brush Holder Screw (fits GS1009 and GS1010, 12 on GS1005)	12
GS1012	Washer, Brush Holder (6 on GS1009, and 2 on GS1010)	8
GS1013	Lock Washer, Brush Holder (4 on GS1009)	4
GS1014	Brush Retaining Clip	4
GS1015	Brush Connector Lead	1
GS1016	Brush and Spring	4
GS1017	Fan	1
GS1018A	Field Coil Assembly, 12 Volt	1
GS1018B	Field Coil Assembly, 24 Volt	1
GS1018C	Field Coil Assembly, 32 Volt	1
GS1019	Screw, Side Panel (4 on GS1030)	4
GS1020	Screw, Field Coil Retaining (uses 8 GS1021)	8
GS1021	Lock Washer (8 on GS1020, 1 on GS1039, 1 on GS1042, 1 on GS1048, 1 on GS1055, 4 on GS1056)	16
GS1022A	Field Coil Set, 12 Volt	1
GS1022B	Field Coil Set, 24 Volt	1
GS1022C	Field Coil Set, 32 Volt	1
GS1024	Mounting Plate (uses 3 GS1025, 3 GS1026)	1
GS1025	Screw, Holding Mounting Plate (on GS1024)	3
GS1026	Lock Washer, Mounting Plate (fits GS1025)	3
GS1027A	Switch Panel Assembly, 12 Volt	1
GS1027B	Switch Panel Assembly, 24 Volt	1
GS1027C	Switch Panel Assembly, 32 Volt	1
GS1029	Switch Panel	1
GS1030	Switch Panel Side Plate ((uses 4 GS1019)	2
GS1031A	Rheostat, 12 Volt	1
GS1031B	Rheostat, 24 Volt	1
GS1031C	Rheostat, 32 Volt	1
GS1032	Knob for Rheostat	1
GS1033A	Cut-Out, 12 Volt (uses 2 GS1034, 2 GS1035, 2 GS1036)	1
GS1033B	Cut-Out, 24 Volt (uses 2 GS1034, 2 GS1035, 2 GS1036)	1
GS1033C	Cut-Out, 32 Volt (uses 2 GS1034, 2 GS1035, GS1036)	1
GS1034	Screw, Cut-Out Terminal (2 on GS1033A, B or C)	2
GS1035	Screw, Holding Cut-Out (2 on GS1033A, B or C, uses 2 GS1036, 2 GS1037, 2 GS1038)	2
GS1036	Nut, Holding Cut-Out (fits GS1035, 2 on GS1033A, B or C)	2
GS1037	Washer, Cut-Out (fits GS1035, 2 on GS1033A, B or C)	2
GS1038	Lock Washer, Cut-Out, also Cover (fits GS1035, 2 on GS1033A, B or C, and 2 on GS1058)	4
GS1039	Screw, Positive Terminal (uses 1 each of GS1021, GS1040, GS1041, GS1045, GS1046, GS1049)	1
GS1040	Nut, Positive and Negative Terminal, also Starter Contact Screw (1 on GS1039, 1 on GS1042, 1 on GS1048)	3
GS1041	Washer, Positive and Negative Terminal, also Starter Contact Screw (1 on GS1039, 1 on GS1042, 1 on GS1048)	3
GS1042	Screw, Negative Terminal (uses 1 each GS1021, GS1040, GS1041, GS1049)	1
GS1043	Starter Switch Blade and Button	1
GS1044	Insulating Strip, Starter Switch Blade	1
GS1045	Washer, Insulating (1 on GS1039, 2 on GS1048)	3
GS1046	Bush, Insulating (1 on GS1039, 1 on GS1048)	2
GS1047	Starter Switch Contact	1
GS1048	Screw, Starter Switch Contact (uses 2 GS1045, 1 each GS1021, GS1040, GS1041, GS1046)	1
GS1049	Nut, Terminal Wing (1 on GS1039, 1 on GS1042)	2
GS1050	Ampere Meter	1
GS1051	Lead, Earth	1
GS1052	Lead, Ampere Meter to Cut-Out	1
GS1053	Lead, Cut-Out to Main Terminal	1
GS1054	Lead, Main	1
GS1055	Screw, Earth (uses 1 GS1021)	1
GS1056	Bolt, Main Holding Field Assembly (uses 4 GS1021)	4
GS1057	Cover	1
GS1058	Screw, Cover Holding (uses 2 GS1038)	2
GS1059	Suppressor	1
GS1060	Condensor, Suppressing	1
GS1061	Terminals, Switch Panel (knurled type)	2
GS1062	Screws, Terminal (knurled type)	2